SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE MARIE, ON

COURSE OUTLINE

Course Title: NETWORK SECURITY

Code No.: CSN208   **Semester:** 4

Program: COMPUTER NETWORK TECHNICIAN

Author   Tycho Black/Mark Allemang

Date: Jan. 2002 **Previous Outline Date:**

Approved: _____ _____

                        Dean   **Date**

Total Credits: 5   **Prerequisite(s):** CSN202 or
                                          permission of instructor

Hours/Week: 4

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I.   COURSE DESCRIPTION:

This course provides an in-depth study of network security issues, standards, best practices and current threats. Supported by extensive lab work, system vulnerabilities will be investigated and solutions implemented using a variety of operating systems and security tools.

II.   LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

A.   Learning Outcomes:

1. Understand network security principles and develop strategies for dealing with common network vulnerabilities and security issues.
2. Deploy firewalls to secure a network.
3. Establish security practices to enable local and remote users to connect securely to internal networks
4. Analyze network requirements and plan security based on those requirements.
5. Develop Intrusion Detection and Response best practices.
6. Specify and implement appropriate tools, utilities and practices to prevent/recover from security attacks/intrusions.

B.   Learning Outcomes and Elements of the Performance:

Upon successful completion of this course the student will demonstrate the ability to:

1.   Understand network security principles and develop strategies for dealing with common network vulnerabilities and security issues.

Elements of the Performance:
- Understand the need for network security and the tradeoffs associated with implementing security.
- Practice ethical behaviour as a network administrator.
- Identify legal issues associated with network administration and implement a security policy for network users to follow.
- Identify general security issues associated with LANs, WANs, Web Servers, VPNs and Remote Access.

- Identify and defend systems against the major types and categories of security threats.
- Implement virus protection and recovery practices on a network.
- Implement security policies and practices that lead to secure networks.

This learning outcome will constitute approximately 20% of the course.
Reference: Norton (Chap 1, 2 and 3) and other notes supplied.

2.   Deploy firewalls to secure a network

Elements of the Performance:
- Compare different types of firewalls with respect to their principles of operation, their strengths and weaknesses.
- Specify and configure various firewall products to meet particular network requirements.
- Evaluate and compare various commercial firewalls.

This learning outcome will constitute approximately 15% of the course.
Reference: Norton (Chap. 4)

3.   Establish security practices to enable local and remote users to connect securely to internal networks.

Elements of the Performance:
- Compare dial-in networking services (RAS), VPNs and other Internet services with respect to their operation and security issues.
- Implement RAS or VPNs enabling secure remote access.
- Implement authentication and password policies that are appropriate for particular situations.

This learning outcome will constitute approximately 15% of the course.
Reference: Norton (Chap. 5, 6)

4. Analyze network requirements and plan security based on those requirements

Elements of the Performance:
- Analyze security requirements and be able to specify services, operating systems, and protocols appropriately.
- Identify the steps required to secure your network servers.

- Identify security issues and then implement appropriate security on Windows NT and Windows 2000 servers.
- Identify security issues and best practices for Novell Netware servers.
- Identify security issues and then implement appropriate security on Unix systems
- Implement security for workstations and common desktops.

This learning outcome will constitute approximately 25% of the course.
Reference: Norton (Chap 7, 8 and 9)

5. Develop Intrusion Detection and Response best practices.

Elements of the Performance:
- Describe the various types of intrusion detection systems.
- Compare commercial intrusion detection systems and implement one.
- Develop a security plan and an intrusion response procedure for situations where a site has been attacked.
- Investigate real case studies of network attacks, intrusion detection and recovery.

This learning outcome will constitute approximately 10% of the course.
Reference: Norton (Chap 10) and Internet References

6. Specify and implement appropriate tools, utilities and practices to prevent/recover from security attacks/intrusions.

Elements of the Performance:
- Use Internet resources to research current security threats and acquire needed software and security patches.
- Use various utilities such as network monitors, packet sniffers, security scanners, intrusion detection systems, password detectors, auditing and integrity checking to protect servers and network resources.

This learning outcome will constitute approximately 15% of the course.
Reference: Internet Resources

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III.   TOPICS TO BE COVERED:
1.   Security Fundamentals and Common Vulnerabilities
2.   Firewalls
3.   Server and Workstation Security
4.   Security Planning and Policies
5.   Intrusion Detection and Response
6.   Security Tools and Best Practices

IV.   REQUIRED STUDENT RESOURCES/TEXTS:

**TEXT BOOK: "Peter Norton's Network Security Fundamentals" by Peter
Norton and Mike Stockman, SAMS (2000)**

V.   EVALUATION PROCESS/GRADING SYSTEM:

3 WRITTEN TESTS   60%
LAB ASSIGNMENTS and QUIZZES   40%
(The percentages shown above may vary slightly if circumstances warrant.)

NOTE: *It is necessary to pass both the theory and the lab parts of this course.* *It
is not possible to pass the course if a student has a failing average in the three
written tests but is passing the lab portion (or vice versa).*

GRADING SYSTEM
A+   90   -   100%
A   80   -   89%
B   70   -   79%
C   60   -   69%
R   Repeat   Less than 60%
X   Incomplete

UPGRADING OF INCOMPLETES
When a student's course work is incomplete or final grade is below 60%, there is
the possibility of upgrading to a pass when a student meets all of the following
criteria:
1.   The student's attendance has been satisfactory.
2.   An overall average of at least 50% has been achieved.
3.   The student has not had a failing grade in all of the theory tests taken.
4.   The student has made reasonable efforts to participate in class and
       complete assignments.

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The nature of the upgrading requirements will be determined by the instructor and may involve one or more of the following: completion of existing labs and assignments, completion of additional assignments, re-testing on individual parts of the course or a comprehensive test on the entire course.

LABS:

Lab activities represent a very important component of this course. Because of this, **attendance is mandatory** and the satisfactory completion of all lab activities is required. *It is the student's responsibility to discuss absences from regularly scheduled labs with the instructor so that alternate arrangements (where possible) can be made to complete the lab requirements.*

Required lab report requirements will be detailed before labs are assigned. **A late penalty will be applied for labs handed in after the due date.**

ATTENDANCE:

Absenteeism will affect a student's ability to succeed in this course. Absences due to medical or other unavoidable circumstances should be discussed with the instructor. Attendance will be taken and those with unsatisfactory attendance (more than 10% of the classes missed) will not be allowed any upgrading, rewrites or other special consideration.

VI.   SPECIAL NOTES:

- **Special Needs**

  Students with special needs (e.g. physical limitations, visual or hearing impairments, or learning disabilities) are encouraged to discuss any required accommodations confidentially with the instructor and/or contact the Special Needs Office so that support services can be arranged.

- **Retention of Course Outlines**

  It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other post-secondary institutions.

- **Course Modifications**

  Your instructor reserves the right to make reasonable modifications to the course as deemed necessary to meet the needs of students or take advantage of new or different learning opportunities.

VII.   PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced standing in the course should consult the instructor. This course is not eligible for challenge at the present time.